Red Pine

Pinus resinosa

The **volume of red pine has increased** significantly since 1983. This volume increase has occurred almost exclusively on sawtimber-sized trees. The number of seedlings has also increased in the last 10 years, suggesting that red pine will continue to play a significant role in the future.

Growth rates of red pine have increased and the ratio of growth to volume in 2008 was much higher than the statewide average. The **ratio of mortality to volume for red pine is much lower** than the average for all species. Red pine makes up about 7% of all volume of trees in Wisconsin, but 12% of growth and less than 1% of total mortality.

Red pine is **an important timber species**, accounting for over 9% of roundwood production in 2003. Red pine roundwood is mainly used for pulpwood and sawlogs, ranking second in sawlog production.

- *How has the red pine resource changed?*
  Growing stock volume and diameter class distribution: 1983, 1996, and 2008
- *Where does red pine grow in Wisconsin?*
  Growing stock volume by region with map
- *How fast is red pine growing?*
  Average annual net growth by region and year: 1983, 1996, and 2008
- *How healthy is red pine in Wisconsin?*
  Average annual mortality: 1983, 1996, and 2008
- *How much red pine do we harvest?*
  Roundwood production by product: 1997, 2003, and 2006
- *How much is red pine selling for?*
  Prices for cordwood and sawtimber: 2000 to present
- *How much red pine biomass do we have?*
  Oven-dry tons by region of the state: 2008

"How has the red pine resource changed?"

Growing stock volume and diameter class distribution by year

The growing stock volume of red pine has almost doubled since 1983 to 1.5 billion cft or 7% of statewide volume (Chart 1). This increased volume has occurred mainly in sawtimber trees (Chart 2). Since 1996, the volume in sawtimber trees has increased 77% while the volume in pole trees has not changed.

Red pine is mainly a planted species. Since 1996 the number of seedlings has increased 21% (Chart 3) suggesting that red pine will play a major role in the future.

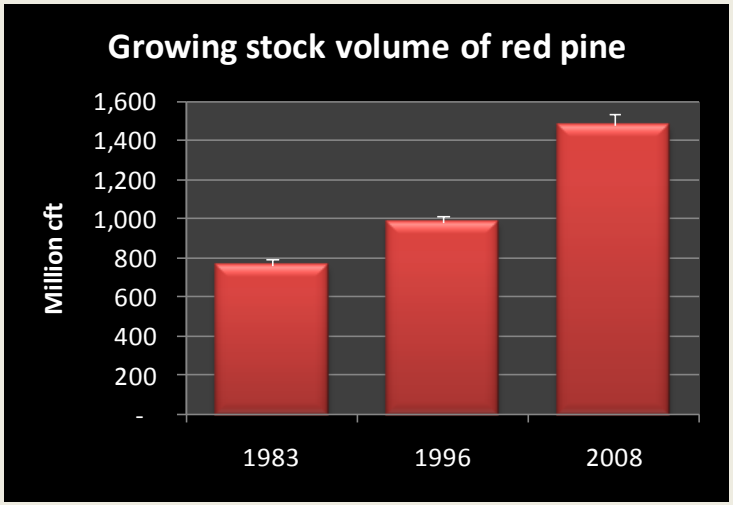


Chart 1. Growing stock volume (million cubic feet) by inventory year.
Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2008.

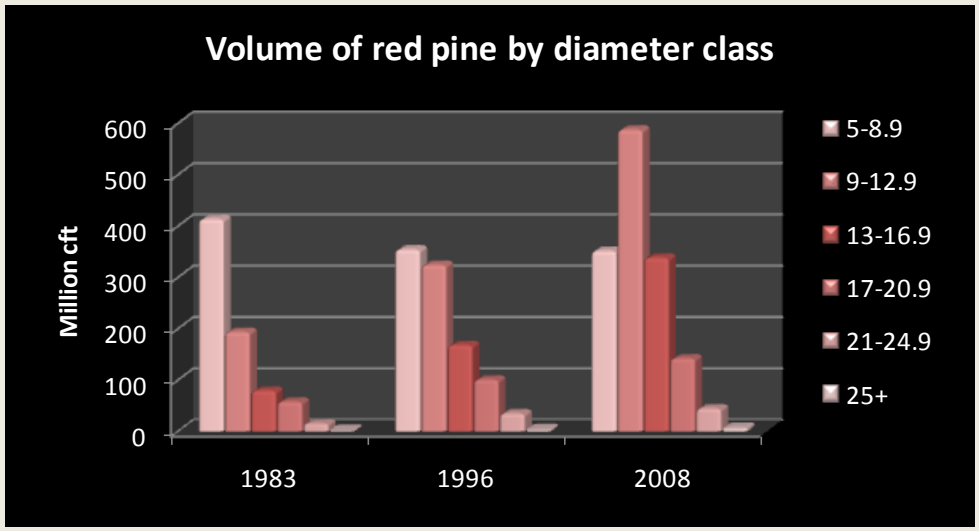


Chart 2. Growing stock volume (million cubic feet) in 1983, 1996, and 2008.
Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2008.

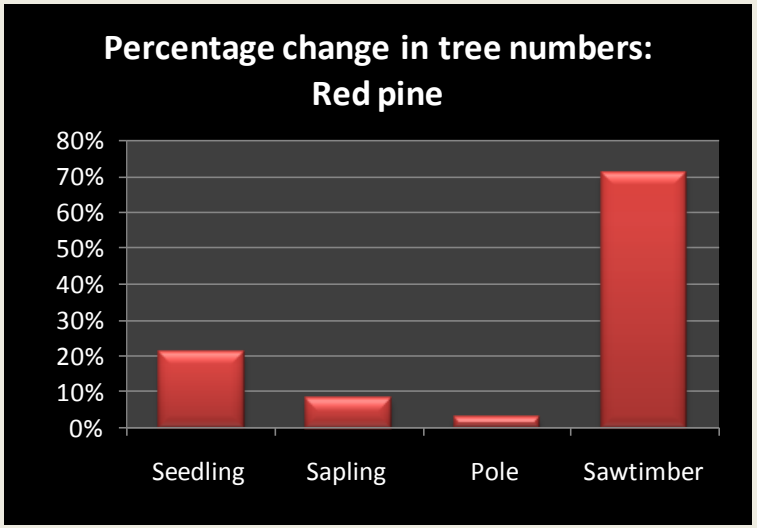
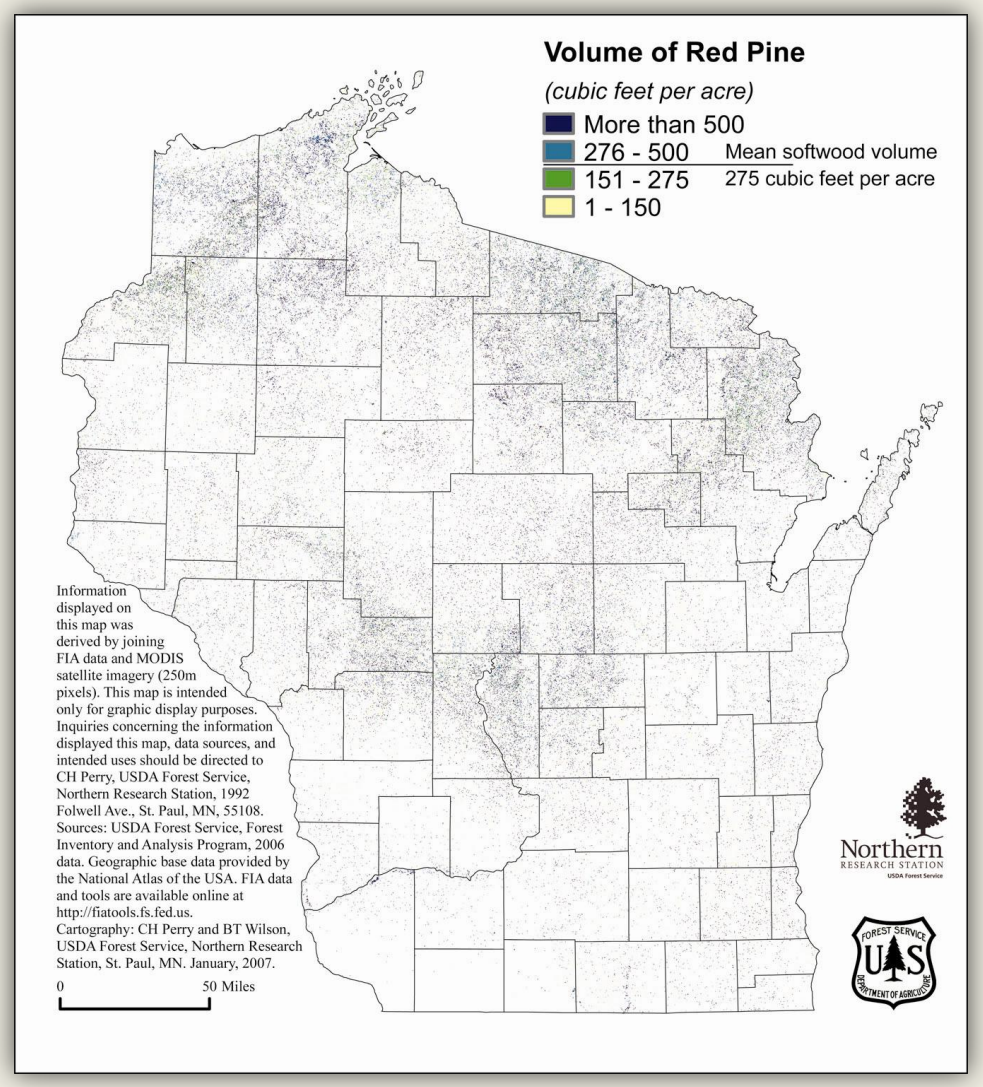


Chart 3. Percentage change in the number of live trees by size class between 1996 and 2008.
Source: USDA Forest Inventory and Analysis data 1996, and 2008.

"Where does red pine grow in Wisconsin?"

Growing stock volume by region with map



The great majority of red pine, 78%, is planted and occurs mainly in the sandy soils of central and northern Wisconsin (Table 1). In addition, this species occurs sporadically on more mesic soils throughout the state.

Table 1. Growing stock volume (million cft) by region of the state.

Species	Central	North east	North west	South east	South west	Total
Red pine	421	546	420	41	57	**1,486**
Percent of total	**28%**	**37%**	**28%**	**3%**	**4%**	**100%**

Source: USDA Forest Service, Forest Inventory and Analysis 2008 data

Additional tables:

Volume by county in 2008 (pdf; Excel)

"How fast is red pine growing?"
Annual net growth by region and year

Average annual growth of red pine was about 67 million cft/yr from 2004 to 2008, or 11.5% of statewide volume growth (Chart 4). Growth rates have increased by about 47% over the last 10 years, mainly due to aging red pine forests.

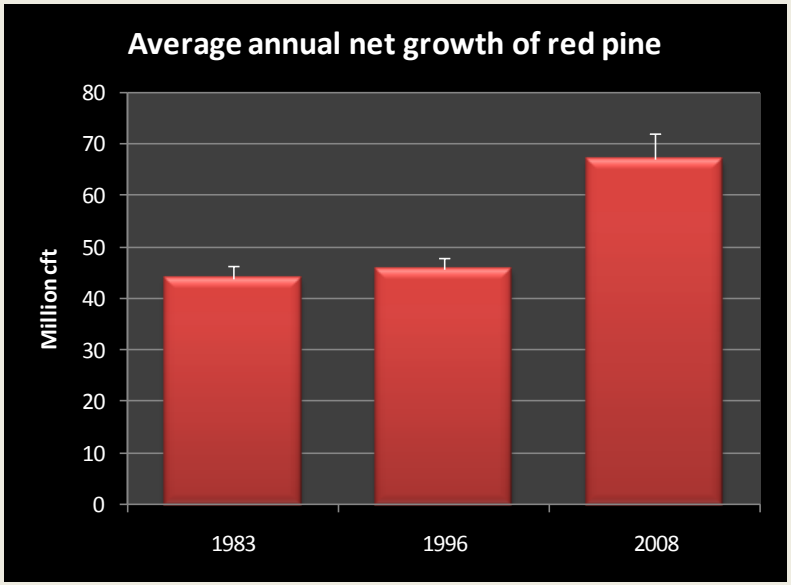


Chart 4. Average annual net growth (million cubic feet).
Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2008

Table 2. Average annual net growth (million cft/year) and ratio of growth to volume by region of the state (2004 to 2008).

Unit	Net growth of red pine (million cft/yr)	Percent of total	Ratio of growth to volume
Central	21.9	33%	**5.2%**
Northeast	20.5	30%	**3.8%**
Northwest	20.6	31%	**4.9%**
Southeast	1.2	2%	**3.0%**
Southwest	3.0	4%	**5.3%**
Total	**67.3**	**100%**	**4.5%**

Source: USDA Forest Inventory and Analysis data: 2008

Although the highest volume of red pine occurs in central and northern Wisconsin, the highest growth to volume ratio occurs in southwest and central parts of the state (Table 2).

The ratio of growth to volume for red pine is 4.5%, much higher than the statewide average of 2.8% for all species.

Additional tables:
Average annual growth, mortality and removals by region (Pdf, Excel).

"How healthy is red pine in Wisconsin?"

Average annual mortality: 1983, 1996, and 2008

Average annual mortality of red pine, about 2 million cft per year in 2008, has increased 65% since 1996 (Chart 5). Red pine accounts for 7% of volume, 12% of growth but only 1% of statewide mortality.

The ratio of mortality to gross growth is less than 3% for red pine, **much lower than the statewide average** of 26%, and lowest ratio of any commercial species (Table 3).

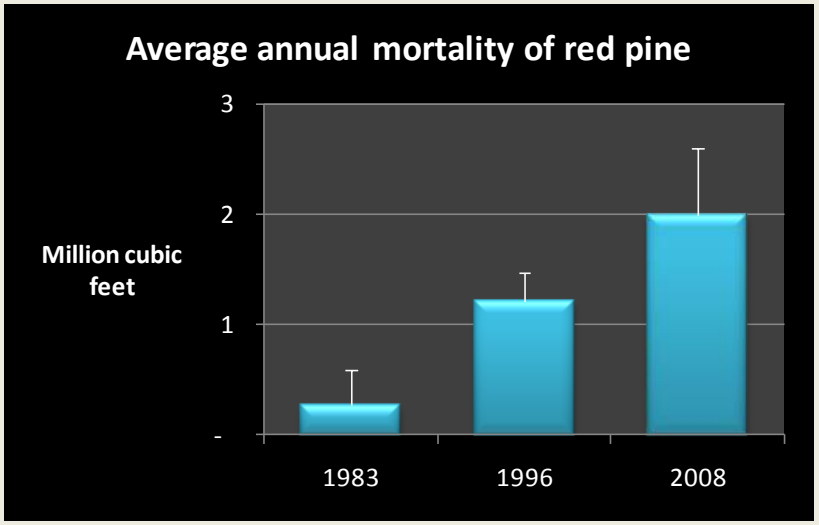


Chart 5. Average annual mortality (million cubic feet) by inventory year.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2008

Table 3. Mortality, gross growth and the ratio of mortality to gross growth.

Species	Average annual mortality (cft)	Average annual gross growth (cft)	Mortality / growth
Red pine	1,991,936	69,296,891	**3%**

Source: USDA Forest Inventory and Analysis data: 2008

Additional tables:
Average annual growth, mortality and removals by region (Pdf, Excel).

"How much red pine do we harvest?"

Roundwood production by product and year

In 2003, red pine accounted for 137.5 million cft or about 9% of Wisconsin's total roundwood. Half was used for pulpwood and half for sawlogs (Chart 6).

In 2006, pulpwood production, down 45% from 1997, accounted for 9% of total pulpwood in the state.

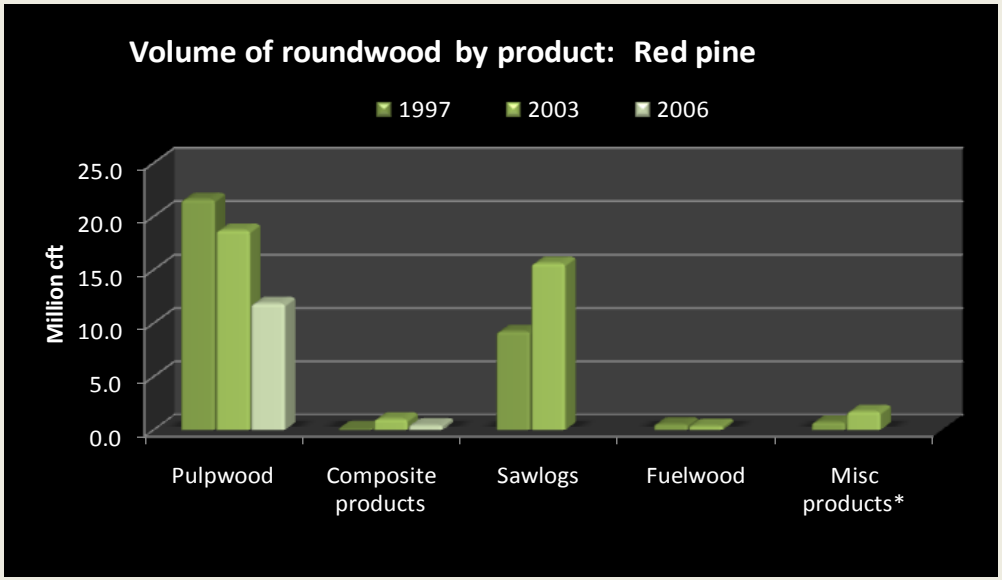


Chart 6. Volume of roundwood products. The most recent numbers for pulpwood and composite products are from 2006 and the most recent numbers for sawlogs, fuelwood and miscellaneous products are from 2003 (Ron Piva).
* Miscellaneous products include poles, posts, pilings and veneer.
Source: Timber Products Output Mapmaker, http://ncrs2.fs.fed.us/4801/fiadb/rpa_tpo/wc_rpa_tpo.ASP

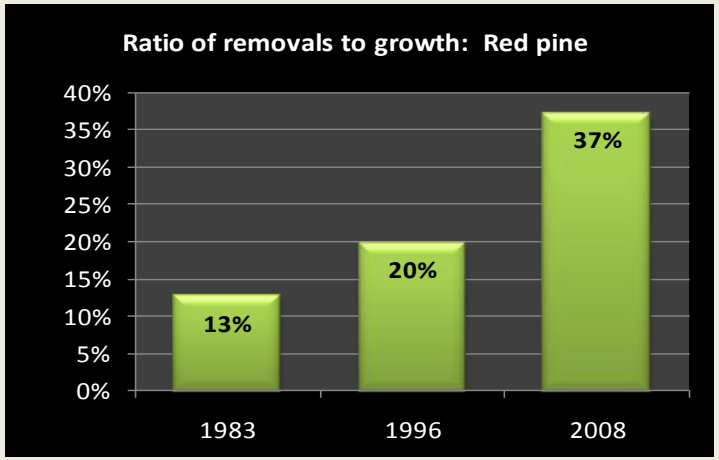


Chart 7. Ratio of volume harvested annually to net growth.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2008.

The ratio of removals to growth is 37% for red pine, lower than the average of 56% for all species (Chart 7). This is most likely due to very high growth rates since removals are also above average.

Additional tables:
Average annual growth, mortality and removals by region (Pdf, Excel).

"How much is red pine selling for?"

Prices for cordwood and sawtimber: 2000 to present

Due to the variability of timber prices from year to year and region to region, two methods of reporting prices are presented here: Timber Mart North (Chart 8) and weighted average stumpage prices from Wisconsin Administrative Code Chapter NR 46 (Table 4).

Both methods show a peak in prices in 2006 and a general decline since then. Prices in 2009 are 60% below 2006 levels.

Red pine prices in 2009 were above the statewide average for all softwood cordwood and logs.

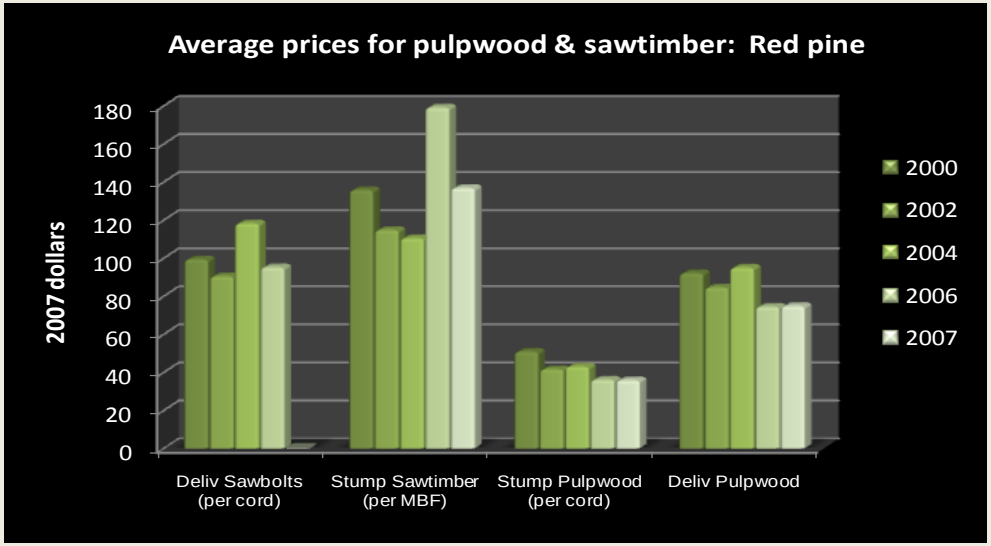
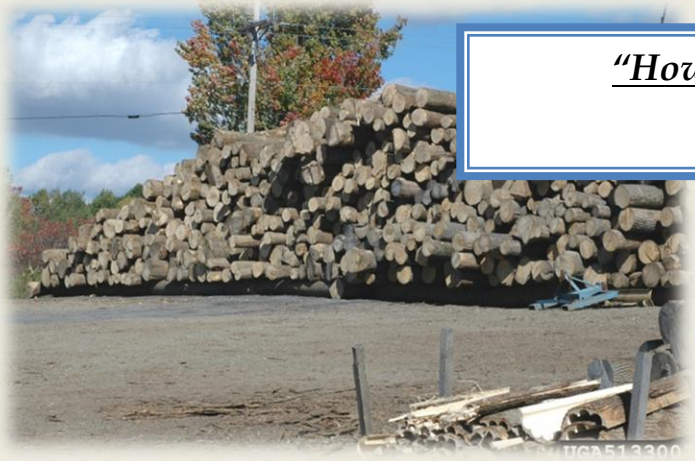


Chart 8. Average prices for cordwood and sawtimber (2007).
Source: Timber Mart North, George Banzhaf & Company, 8301 N. Allen Lane, Milwaukee, WI 53217

Table 4. Average weighted stumpage prices (adjusted for inflation to 2009 dollars) by year for Wisconsin.

Product	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average for all softwoods
Cordwood (per cord)	$55	$62	$58	$56	$57	$61	$85	$62	$33	**$34**	$23
Logs (per MBF)	$153	$174	$196	$164	$161	$179	$239	$150	$109	**$113**	$76

Source: Wisconsin Administrative Code Chapter NR46, 2000 to 2009



"How much red pine biomass do we have?"

Oven-dry tons by region of the state

There were 27.5 million oven-dry tons (ODT) of red pine biomass in 2008, a decrease of 9.6 million ODT or 54%, from 1996. This species represents 4.6% of all live biomass statewide. As with volume, most red pine biomass is located in central and northern Wisconsin (Chart 9).

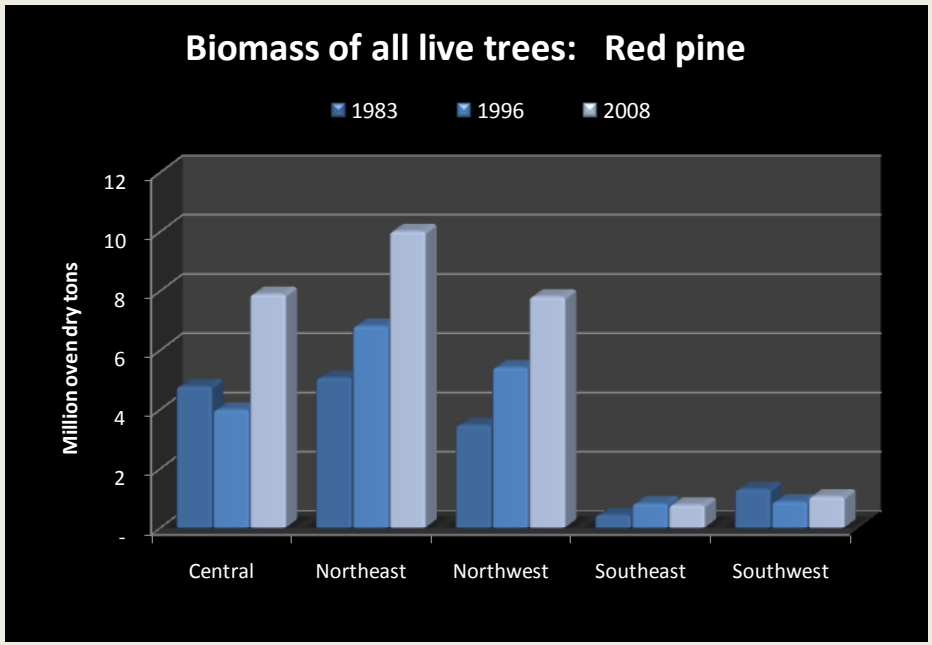


Chart 9. Biomass (million oven-dry tons) by year and region.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2008

The density of red pine wood is about average for softwoods with a ratio of biomass to volume of 35.3 oven-dry lbs. per cubic foot (ODP/cft). The average for all softwoods is about 34.3 ODP/cft and for all species is 46.8 ODP/cft.

Approximately, 81% of all red pine biomass is located in the main stem and 14% in the branches.

Additional tables:

Biomass by county in 2008 (pdf; Excel)